

CLAIMS

1 - Method for sterilizing hollow bodies (9) having an opening (8), of a consistent type to deposit on the surfaces to be sterilized a sterilizing agent that is previously vaporized, characterized in that it consists of carrying out the vaporizing of the agent outside the hollow body, close to its opening and with the use of a means of aspiration opening out into the hollow body opposite the said opening, to cause a gaseous current for guiding the vaporized agent toward all of the surfaces to be sterilized in order to distribute the agent on all of the said surfaces.

2 - Method for sterilizing hollow bodies (38) having two openings, of a consistent type for depositing on the surfaces to be sterilized a sterilizing agent that is previously vaporized, characterized in that it consists of implementing the vaporizing of the agent outside the hollow body, close to one of its openings and with the use of a means of aspiration opening out into the hollow body opposite the said opening, to cause a gaseous current for guiding the vaporized agent toward all of the surfaces to be sterilized in order to distribute the agent on all of the said surfaces.

3 - Method according to ~~any one of the preceding claims~~¹, characterized in that the sterilizing agent is chosen from among the agents available in liquid phase, such as hydrogen peroxide, peracetic acid or other.

4 - Method according to ~~any one of the preceding claims~~¹, characterized in that the phases of vaporizing and introduction of the agent into the hollow body are preceded by a phase of suppression of particles or other non-adherent elements present in the hollow body.

5 - Method according to claim 4, characterized in that the suppression phase is carried out by insulation.

6 - Method according to claim 4, characterized in that the suppression phase is carried out by aspiration.

a 7 - Method according to ~~any one of the preceding claims~~, characterized in that the vaporizing phase is followed, after a period of contact by the agent with the surfaces to be sterilized, by a phase of withdrawal of the remaining sterilizing agent.

8 - Method according to claim 7, characterized in that the withdrawal phase is carried out by injection of a withdrawal agent in the inside of the hollow body.

9 - Method according to claim 8, characterized in that the withdrawal agent is a sterile dry or hot gas.

10 - Method according to claim 9, characterized in that the withdrawal agent is brought by aspiration into the inside of the hollow body, by using aspiration means acting in the hollow body opposite its opening.

11 - Method according to ~~any one of claims 8 or 9~~, characterized in that the sterile gas is hot air injected using a hot air nozzle.

12 - Method according to claim 8, characterized in that the withdrawal phase is carried out with the use of a flame injected by a burner and brought by aspiration into the inside of the hollow body with the use of the aspiration means acting in the latter opposite its opening.

a 13 - Method according to ~~any one of claims 8 to 12~~, characterized in that the withdrawal agent, dry or hot gas or flame respectively, is injected on the outside of the hollow body close to its opening.

a 14 - Device for carrying out the method according to ~~one of claims 1 to 13~~, characterized in that it comprises the means (1) for injection of a vaporizable sterilizing agent, and evaporator (2) across from the output of the injection means, aspiration means (7, 13; 40, 41)

opening out into the hollow body in such a way as to act inside same to cause a gaseous current guiding the vaporized agent toward the interior surfaces of a hollow body (9; 38) when the latter is in place with respect to the device.

15 - Device according to claim 14, characterized in that the evaporator is enclosed in a housing (3; 36) arranged on the outside of the hollow body (9; 38) close to the opening of the latter and provided with an opening (4) across from the output of the means (1) of injection, of an open end having the shape and interior dimensions essentially corresponding to those of the interior opening of the hollow body (9; 38).

16 - Device according to ~~one of claims 14 or 15~~ ^a characterized in that the means (7, 13; 40, 40) for causing the gaseous current are made up of a tube (7; 40) connected to an aspiration source (13; 41).

17 - Device according to claim 16, characterized in that since the hollow body is in the shape of a container, i.e. open at one of its ends and closed at the other, the tube (7) is introduced through the opening of the hollow body; the tube has an end opening out next to the base of the hollow body and its second end, located at the side of the housing (3) is connected to the aspiration source (13).

18 - Device according to claim 17, characterized in that the tube (7) crosses the evaporator (2) and the housing (3).

19 - Device according to claim 16, characterized in that since the hollow body (38) is a tube or a conduit open at two opposite ends, the aspiration is carried out by arranging the aspiration tube (40) at the end of the hollow body opposite the one where the injection takes place.

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a 20 - Device according to ~~one of~~ claims 14 to ~~19~~, characterized in that it comprises the means for withdrawing the sterilizing agent after a period of contact in the hollow body.

21 - Device according to claim 20, characterized in that the means have a generator (16; 21) for dry or hot sterile air.

22 - Device according to claim 21, characterized in that the generator is a burner (21).

o 23 - Device according to ~~either of~~ claims 21 and ~~22~~, characterized in that the generator (16; 21) is placed outside the hollow body near its opening, and it has means to direct the heat inside the hollow body.

24 - Device according to claim 23, characterized in that the means to direct the heat are made up of an aspiration tube (7; 22; 40) of which the aspiration end opens out into the hollow body in a zone that is at a distance from its opening in order to direct the heat into all of the hollow body.

25 - Device according to claim 24, characterized in that since the hollow body is a container, the tube (7; 22) penetrates through the opening of the latter and opens out close to its base.

26 - Device according to claim 24, characterized in that since the hollow body is a tube or a conduit, the tube (4) is arranged at the end of the hollow body opposite to that close to which the heat generator (16; 21) is located.

a 27 - Device according to ~~one of~~ claims 14 to ~~26~~, characterized in that it comprises the means for carrying out a suppression of dust or other particles previous to the vaporizing phase and the placement of the sterilizing agent.

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28 - Device according to claim 27, characterized in that the suppression is carried out by aspiration and/or insulation.

b 29 - Device according to ~~one of claims 14 to 28~~, characterized in that it is surrounded by a laminar flow (35) of sterile gas, in excess pressure, such as air.

a 30 - Installation for manufacturing and/or filling containers, characterized in that it comprises a device according to ~~any one of claims 14 to 29~~.

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